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PSYCHOLOGY AT THE ST. LOUIS CONGRESS

WITH a single exception all the psychological papers presented at the St. Louis Congress have now appeared in print.[1] In the opinion of the editor of this JOURNAL the time is therefore ripe to take stock of these contributions to our knowledge and mutual understanding.

Two very vivid impressions of a general kind instantly force themselves on the reader of these addresses. The first has to do with the amazing breadth of the domain preempted by contemporary psychology and the astonishing development of methodological technique which has evidently been achieved in many of its provinces. Specialists are, of course, keenly alive to this fact, but it is brought home with peculiar pungency by a serial perusal of these St. Louis papers, flanked as they are on the one hand by the distinctly metaphysical considerations of Mr. Ward's address and on the other by the eminently empirical intricacies suggested by the papers of Messrs. Titchener, Janet and Prince. Surely there are few readers capable of following all of these addresses with intelligent appreciation, and still fewer to whom they could all be of vital interest. The unification of knowledge which this congress was to glorify is, in this department at least, for the most part a figment of the imagination, an ideal toward which progress may ultimately bear us, but from which at the present moment we are conspicuously remote.

The second impression is one of disappointment that the list of speakers could not have been more fully representative. Those who appeared on the platform were all eminently worthy of the honor accorded them, but an international program from which one misses the names of Ribot and Binet, Wundt and Stout, James and Dewey —to mention no others—is hardly to be regarded as entirely representative. No doubt this circumstance was due to insurmountable difficulties, but the fact remains what it is, and in its personnel, at least, the St. Louis program must be voted but a partial success.

[1] Mr. MacDougal's paper has not yet been published.

When one comes to the papers themselves, one is again likely to feel a little disappointment that so distinguished a group of speakers should have offered upon an occasion of such moment so little that is fundamentally fresh. This outcome is, however, an all but inevitable consequence of the plan upon which the program of the congress was based. The principle involved unavoidably caters to a retrospective and somewhat obituary attitude of mind, and *pari passu,* tends to discourage in some measure the more striking and personal forms of originality. It is the voice of authority speaking of things past which we chiefly hear in these addresses, rather than the voice of discovery and revelation. This no doubt accounts for the seriousness of tone which characterizes most of the papers. The delightful persiflage of parts of Mr. Cattell's paper affords almost the sole exception to this rule. To be sure, science on dress parade is always prone to be a bit sombre, and this, perhaps, is as it should be. In any case, in passing judgment on these addresses, one has to remember the limitations with which their writers were hedged about.

Four sections were provided to meet the various interests represented by the modern organization of psychology—a section each for general psychology, experimental psychology, comparative and genetic psychology, and abnormal psychology. Two addresses were delivered before each section, and Messrs. Baldwin and Cattell presented papers at a general introductory session.

In Mr. Baldwin's opening paper on the history of psychology[2] we have the author at his best. His outline is bold, clear and suggestive, and several of his own recent contributions to psychological theory are incorporated in his interpretations in a way which distinctly clarifies their meaning. One is moved to criticism only by certain omissions, and by certain rather daring *obiter dicta.* But in a brief address something must inevitably be sacrificed to the exigencies of the occasion.

The gradual rise among the Greeks of the distinction between the inner and the outer world is briefly traced and the reason for a failure to found a science of mental contents is referred to the fact that the technique of control over these inner materials was not yet elaborated, and consequently they appeared intractable to scientific treatment.

In his account of medieval and Renaissance psychology Mr. Baldwin is disappointingly brief. To be sure, it has been traditional to view these periods as relatively barren for psychology proper, yet this is but one reason the more why one wishes that the

[2] 'Sketch of the History of Psychology,' *Psychological Review,* 1905, pp. 144–165.

author had seen fit to apply to it more fully his talent for fertile and ingenious interpretation.

Modern scientific psychology is characterized by (1) a scientific naturalism, *i. e.*, the conception of all phenomena of every kind as parts of a natural order under the domain of discoverable laws; and (2) by a scientific positivism, by which Mr. Baldwin means the theory that a method of research is possible for the genuine ascertainment of these governing laws. These characteristics are vicarious heritages borrowed from the physical sciences, which have long possessed them, and from biology, which has acquired them only at a relatively recent date.

Nineteenth-century psychology Mr. Baldwin regards as the immediate outgrowth of influences emanating from Hume and Rousseau. By this statement is implied that in the Locke-Hume tradition we have the individualistic aspects of psychology emphasized, whereas with Rousseau and later in Comte the social elements come in for their proper recognition.

The respective influences on psychology of biology as represented by Lamarck and Darwin and the physicomathematical sciences represented by Fechner are given due weight, and the author then proceeds to a brief but illuminating exposition of the specific points at which these various influences become most conspicuous. The failure of the genetic principle in psychology to gain a firm foothold, despite the influence of biology, is much emphasized and two of our great psychologists of the end of the nineteenth century, James and Wundt, are criticized for a failure fully to recognize this principle, notwithstanding their positivistic and naturalistic tendencies.

Mr. Baldwin concludes with a word of prophecy in which he predicts that positivism and naturalism are here to stay, that psychology will in the future be thoroughly social and also thoroughly functional. Structural psychology, looking toward a psychic atomism, is doomed to extinction.

The last prediction savors a little of writing the funeral orations of persons still enjoying vigorous health. Undoubtedly, in the present writer's opinion, structural psychology must be conjoined with a psychology of function, and undoubtedly the psychology of function is that which will stand in closest relations to practical interests and to those other sciences which desire, as does sociology, for example, to utilize the product of psychology. But it appears equally patent that a functional psychology which lacked wholly a correlative structural psychology, would be at best but a disembodied spirit, wandering restless over an unreal world.

Mr. Cattell's brief but brilliant and racy paper[3] leads one to

[3] 'Conceptions and Methods of Psychology,' *Pop. Sci. Monthly*, 1904, pp. 176–186.

regret that he does not oftener allow the rigors of editorial labor to permit his taking pen in hand for the discussion of the fundamental problems of psychology. To be sure, if there were in his audience any of the old-school critics who found the style of James's 'Psychology' indecorous, they must have shuddered at certain of Mr. Cattell's passages. But somewhere between indecorum and gloomy sobriety there must surely be an avenue where dignity and charm may both sojourn, and one wishes that our psychological writers might more often dally beneath its grateful shades.

Mr. Cattell sets out with the stimulating contention that psychology can not be defined, and in the next sentence he defines it as that in which 'the psychologist is interested *qua* psychologist.' Upon which one is forthwith moved to inquire—what is a psychologist? This is simply to say that the author finds it difficult satisfactorily to distinguish between mind and not-mind. Consciousness is a peculiarly pervasive kind of thing which keeps appearing when you least expect it. And Mr. Cattell says with much reason that the distinction between mind and matter is the last word of a critical philosophy rather than an obvious distinction to be bandied about by makers of definitions.

Mr. Cattell's definition but utters in a different voice a protest which he formulates again in his plea against all arbitrary and preconceived limitations of the territory of psychology. He would let the psychologist roam just as far afield as there seemed to be any promise of valuable and useful spoils. This is surely sane and modern and unscholastic and welcome. The only limitations which he would recognize in psychology or elsewhere (and much of what he says about psychology is equally applicable to any other science) is that given by the psychological constant (?) the mind of man, the mind of the scientist.

The author has some hard things to say of introspection which has enjoyed, he thinks, a wholly factitious eminence as a psychological method. Many of the most valuable laboratory experiments are, he contends, quite independent of introspection. The present writer fancies himself quite in sympathy with the point of Mr. Cattell's contention, but in his judgment the issue between Mr. Cattell and the victims of his criticism is rather an issue of terminology than an issue of fact. If by introspection one means the reflective analysis of what goes on in one's own mind, then undoubtedly much psychological experimentation is not introspectional. But many moderately competent persons would deny that such experiments are, strictly speaking, psychological at all. They are psychophysical, or psychophysiological, or what not. Their point is not to understand the constitution and mode of operation of mental

states, but something else. Now, by refusing to give any definition of psychology which confines it to mental analysis, Mr. Cattell is able to call all these things psychology and to deny introspection as a universal method. Would it not be logically as defensible and significant to deny introspection as a mathematical method?

Mr. Cattell maintains that the great methods of all science, *i. e.*, the quantitative and genetic methods, are those which are valid in psychology, and here he will doubtless have the sympathy of all his colleagues. This does not mean that genetic psychology and experimental psychology are to become independent departments of psychological science. It means that they are real methods of attacking problems in any psychological field where they can actually be employed.

The author concludes, like Mr. Baldwin, with a word of prophecy —that we shall eventually have a profession of psychology, just as we now have one of law and one of medicine. The business of the profession will be found in the application to the control of human nature of our knowledge about the laws which maintain in its constitution. On the side of pathological conditions, at least, this is surely no idle dream of a day far removed.

In the section devoted to general psychology, Messrs. Ward and Höffding had the floor. Mr. Ward's address[4] bears in a marked degree the impress characteristic of all his work, disclosing a keen, critical acumen working on a foundation of broad and accurate scholarship. The philosophical flavor is distinctly strong. The metaphysics of psychology is at stake. The argument is so closely articulated as to render very difficult any detailed reproduction of it. We must, therefore, rest content with a merely impressionistic sketch in which we may hope to avoid undue distortion of line and light and perspective.

Mr. Ward feels that one of the pressing problems of the day is the definition of psychology, and in the effort to reach some solution of this difficulty he is plunged at once into a discussion of the relations of subject to object in experience and especially into a consideration of the nature of subjective activity. No one can question that in the past this corner of psychology has been indeed a dark and desolate spot. As Mr. Ward says, psychologists of one stripe have generally confined themselves to the examination of that which is empirically given, without inquiring to whom or to what it is given; whereas another group has postulated some substrate for the given, but has regarded it merely as a necessary hypothesis to account for the existence of the given, not as itself an

[4] 'Present Problems of General Psychology,' *Philosophical Review*, 1904, pp. 603–621.

actual element of experience. The first of these views apparently involves neglecting altogether one fundamental fact about consciousness, the other recognizes the necessity for some such fact, but in effect denies its existence.

Mr. Ward's suggested solution of this *impasse* strongly suggests the pragmatic light which has recently been shining above the philosophical horizon. The essence of subjective reality, he says, is to be found in selective conative activity. The counterpart to this activity is that which we know as objective reality, and experience is just the interaction of the two. This duality is a real relation antecedent to but never completely covered by reflective knowledge. "A subject *per se* and an object *per se* are alike not so much unknowable as actually unreal." To be sure, conative activity is indescribable and inexplicable save in terms of itself, but this is only to say that 'it is our immediate actual being, that we can not get behind or beyond it . . .'

Space permits but a single commentary upon this view. Can a thing which is only describable in terms of itself be really an object of knowledge; and if not, does the second part of Mr. Ward's solution really (in its actual content as distinct from its verbal formulation) get beyond the position of those who regard the subject as a postulate simply?

The concluding portion of the paper is dedicated to a telling assault upon sensationalistic or atomistic psychology whose contemporary recrudescence Mr. Ward feels to be fraught with menace. The author suggests a few reasons which he thinks explain the vitality of this type of psychological thinking, but he then proceeds to point out that well-attested evidence from every field of psychological study indicates the inadequacy and falsity of the conception of mental life which underlies the atomistic view. Psychological reality is not to be found in isolated mental atoms, but in functional unities of organic action. Atomism and associationalism find their only truth within the limits marked out by habit. Actions which have already become automatic can, indeed, be thus explained, but the formation of habits, the facts of progress in mental life . . . these all fall forever outside such categories. Subjective interest is the thing which originally integrates the presentations that later take on the features of automatism, and interest can never find a real home in the associational psychology.

To all of which one is inclined to respond with a fervent 'Amen,' save that one hesitates to admit that the contemporary atomist is quite so black as Mr. Ward paints him. There are plenty of psychologists to whom Mr. Ward would probably give the name atomist who believe no more than he does that the actual workings of the

mind are statable in terms of isolated ideas and sensations, who nevertheless maintain on methodological grounds, that it is practicable and useful to treat the mind as though this were the case, just as it is at times practicable and useful in geometry to treat a line as an aggregate of points. This view is admirably set forth in the opening sentence of the very next address.

A few paragraphs are given at the end of these discussions, somewhat by way of an appendix, to a reference to the problem of the subconscious and its bearing through the memory processes on the whole psychology of ideation. Taken as a whole, Mr. Ward's paper is highly stimulating and suggestive, and ought to be of real service in inciting to a clearer understanding on these fundamental issues.

Like the preceding address, Mr. Höffding's[5] paper has a dominantly philosophical tone, and contains many passages which suggest, as in the case of Mr. Ward, the influence of recent pragmatic utterances.

Mr. Höffding calls attention to the obvious limitations on the correspondence between mental reality and the mental elements with which psychology is obliged to work. In the exaggerated emphasis upon the significance of these elements is to be found one of the basal reasons for the tendency toward a voluntaristic psychology in which the facts of emotion, will and individual initiative come to their own. Psychology of this last type finds much comfort in the biological support which it is able to command.

The manner in which the problem of psychology is conceived leads to the division of modern psychologists into two main schools of thought which Mr. Höffding would designate as respectively the analytic and the synthetic, a distinction essentially synonymous with that between intellectualism and voluntarism, between associational atomism and personal idealism. "The task of the synthetic school is to find the special forms of unity and continuity which can not be deduced *a priori,* and then to explain how it is possible that mental life in certain cases can have a sporadic character. The task of the other school is to describe the particular forms and degrees of isolation, and then to explain how there can be unity and continuity in mental life."

The essential truth of the synthetic view is proven, in the author's opinion, by the facts of pathological psychology, from which it seems clear that definite effort is necessary in order to unite the different elements of consciousness. (This point is brought out, as it chances, in one of the subsequent papers on abnormal psychology.) However much use, then, psychology may—and must—make of

[5] 'The Present State of Psychology,' *Psychological Review,* 1905, pp. 66–77.

analytical procedure, the synthetic, non-atomistic view of mind is fundamentally correct.

Psychology, so far as concerns its actual modes of procedure, occupies a middle ground between the historical and the physical sciences. As compared with the latter, it is relatively historical. As compared with the former, it is relatively analytical. This seems to be in substance a somewhat roundabout recognition of the genetic element in psychological methodology.

As a further matter of method, Mr. Höffding contends for the recognition of causality as obtaining between mental states. To be sure, we can not formulate this causality in terms of continuity and equivalence, for we have as yet no mental units in terms of which to frame such a formula. But surely, he insists, we have that practical elementary causality which always exists among qualitatively different phenomena, the kind of causality from which science has always set out. Moreover, if the brain processes are causally related to one another, we may safely predicate of the conscious processes an indirect causality at least. To be sure, the only working hypothesis as to the mind-brain connection at present defensible is that of a parallelism of a strictly mathematical variety. What the ultimate relations may prove to be is matter for metaphysics.

Psychology in its intermediate position between the historical and the physical sciences is in a position to clear up many of the obscurities peculiar to these neighboring lines of inquiry. If, for example, it is not possible to deduce pedagogics and esthetics from psychology, it is at least possible to render the deliverances of these sciences far more intelligible by the employment of one's psychological knowledge. Similar is the relation of psychology to epistemology and the philosophy of religion. Psychology does not afford in these cases a principle of prediction or a law from which deductions can be made. It furnishes rather a method of interpretation and appreciation.

Much may be said in rebuttal upon the last two points, but there is a very definite value in knowing where a man of such prominence as Mr. Höffding stands on these basic questions.

The section on experimental psychology was addressed by Messrs. Titchener and MacDougal. We have only the paper of the former gentleman.[6] This is written in the author's usual clean-cut and incisive manner which always gives one an agreeable certainty of what he is driving at. The paper contains a scholarly and conservative estimate of the work done and still requiring to be done in the field of adult normal psychology. The address is so compact

[6] 'The Problems of Experimental Psychology,' *Am. Jour. of Psychology*, 1905, pp. 208–224.

and concise that it is difficult to give a just impression of it without quoting it *in extenso*. The main points, however, may be set down as follows, dwelling almost wholly upon the author's judgment of the work still requiring to be done. This procedure involves some risk of conveying an unjustly depreciatory impression as regards the work already accomplished.

In the range of sensation the great desideratum is an investigation of the organic sensations, to which the author justly refers as almost wholly a closed chapter. The importance of this chapter in its bearing upon the psychology of the self, to mention but a single point, can not be doubted. Much remains to be done in detail upon taste, smell and the cutaneous senses, although the main lines of advance are probably for the most part already laid down. Sight and hearing represent the territory best explored, though even here revision and further research will doubtless be found necessary in many particulars.

In psychophysics, which stands so closely related to the psychology of sensation, Mr. Titchener feels that the main need is for faithful and patient testing of the methods hitherto elaborated rather than for ingenious inventions of new methods. And with this opinion the present writer is heartily in accord. The problem of affection, despite the large amount of work devoted to it, is still in its entirety a frontier territory where disorder largely holds sway. As regards both methods of approach and fundamental principles widespread disagreement is the only uniform thing. In this connection Mr. Titchener expresses a pessimistic estimate upon the plethysmograph as a differential instrument for the study of affection. This avowal is peculiarly gratifying to the present writer, who has for a number of years been in a lonesome minority preaching essentially this doctrine.

The relation of attention to the affective processes needs much further illumination, to say nothing of the very question of the constitution of the attentive consciousness itself, the peculiarities of attention as it appears in the various sense departments, and the mechanism of distraction.

In the field of perception Mr. Titchener sees a demand chiefly for further work along lines already open, although he puts in a plea with which many psychologists will surely sympathize (especially those who have been guilty of text-books), for a banishment of the term perception and a devising of substitutes for it appropriate to the various specific occasions upon which one has to employ it.

Recognition, memory and association all require much further investigation, for which Mr. Titchener thinks it very important to

distinguish between the applied psychology of memory (with which a number of recent studies have dealt) and the theoretical knowledge of the memory process, distinguishing again sharply in the latter province between the psychophysics of memory and the strictly psychological or introspective determination of the memory pattern, etc.

The action consciousness deserves a more strictly psychological, as distinguished from a psychophysical and physiological, investigation. Imagination as a category coordinate with memory and referring to a group of representative conscious forms has hardly been opened up at all. A similar thing is practically true of the more elaborate intellectual processes, although here we have of late had some admirable work upon the judgment and the mental conditions immediately related to it.

The concluding portions of the paper are in part devoted to a few timely criticisms upon certain specific forms of experimental psychology which have enjoyed patronage of late years, particularly that form in which, as Mr. Titchener puts it, you 'throw stimuli into the organism, take reactions out, and then—infer the fact of a change in consciousness.' The glamor of scientific accuracy and worth which can be cast over work of this kind has given it a wholly undeserved repute.

The final point Mr. Titchener makes is a plea for the utmost refinement of method applicable to the problem in hand, whether it be a problem of adult psychology, studied under laboratory conditions, or a problem in the genetic psychology of children or animals. Taken in its entirety, Mr. Titchener's paper is a most instructive and wholesome piece of writing.

The section devoted to comparative and genetic psychology was addressed by Principal Lloyd Morgan and Miss Calkins. Mr. Morgan's paper,[7] which covers rather a wide range of territory, is fundamentally concerned with elaborating the problem of genetic sequence. The primordial phenomena from this point of view are biological reactions. These are followed at a higher level by reactions in which feeling-tone appears, and finally we come upon the ideal schemes of ideal worth by which conduct in its higher phases is governed.

The essential business of comparative and genetic psychology, by means of which such principles as the above have been reached, is found in investigating the nature and mode of development of mental processes in their synthetic aspect. Its aim is explanatory rather than descriptive and it fails of its mission if it does not

[7] 'Comparative and Genetic Psychology,' *Psychological Review*, 1905, pp. 78–97.

succeed in throwing light on the principles of general psychology.

Surely this is too modest an estimate of the place of comparative and genetic psychology. It will be welcomed into the rank of psychological investigation whether it is always able definitely to articulate its results with generally recognized principles or not. Moreover, this statement seems to depreciate needlessly the scope of description in these new branches of psychological research. The instinct to keep near established principles is doubtless sane, but this ought not to involve the danger of bias in favor of preconceived doctrine, nor should it prejudice fresh and accurate description of the phenomena involved. Explanation is of course an ultimate ideal of all psychology, but description is a necessary handmaid for this enterprise. After all, Mr. Morgan's point concerns a matter of emphasis, and on this there need be no serious disagreement.

In the course of his address, Mr. Morgan brings forward one ingenious conception, a conception which has, perhaps, principally a metaphorical value, but which is in any case fertile of suggestion. He compares the general control mechanism of the nervous system to an environment by which the automatic system finds itself surrounded. Conduct from this point of view is the product of heredity (the automatic system) into environment (the higher control system). To be sure, in human evolution there is always a striking transfer of control from the organism merely as such to the social environment. On the psychological side the counterpart of this is found in the higher mental processes and especially in the elaboration of language with its double psychological and social character. It is on this level that we come upon the controlling influence of the ideational processes in distinction from the more purely perceptual activities which probably are the main factors in the determination of animal behavior.

Miss Calkins spoke upon the limitations of comparative and genetic psychology.[8] Miss Calkins's address, in spirit and tone, is diametrically opposed to that of Mr. Cattell, already referred to. She is all for drawing lines and marking off distinctions. He is all for letting down the bars in every direction.

In the first place, Miss Calkins denies the possibility of a genetic psychology to the upholders of any form of the Humian conception of the self. If consciousness is in reality merely a succession of ideas, you can have no genetic phenomena to study, for nothing continues to be the subject of development. We must have a self of some sort in order to have in sober truth any such science as genetic psychology. Genetic psychology is, then, the study of developing

[8] 'The Limitations of Genetic and Comparative Psychology,' *British Journal of Psychology*, 1905, pp. 261–285.

selves. Moreover, genetic psychology is primarily individual, although through the imitative factors involved in learning, we come in the course of development upon a social aspect which leads out into a race psychology.

Comparative psychology has as its first concern the determination of the criterion of consciousness. The only point in which the various antagonistic theories upon this subject agree is in their recognition of 'adapted reactions' as indubitable evidence of the presence of consciousness wherever such reactions can be detected. But the continuity theory of course maintains that consciousness and life are coextensive and that the inability to point out adaptive reactions with certainty can never be accepted as conclusive evidence of the absence of mental processes. Miss Calkins's analysis of the arguments on these points is extremely skillful and lucid. In point of fact, comparative psychology is at the present time actually as broad as the phenomena of animal life.

The problem of the nature of animal consciousness Miss Calkins attempts to attack by summarizing the results of a large group of investigations upon animals representing various stages of organic development. She maintains that, even in the simplest, crudest form of consciousness imagination is implied. The animal learns to do something better than he did at first, and does it even under changed conditions. It certainly seems probable that certain animals have processes comparable in some respects with human imagery. But the present writer, at any rate, feels that in the case of the very low organisms, the assumption of even a rudimentary type of imagery is highly fanciful. Miss Calkins is surely on firmer ground when she says that even the higher animals react chiefly, if not invariably, to total concrete situations, not to isolated relations. Moreover, she truly says that our knowledge of the extent of social factors in animal consciousness must wait upon an adequate objective criterion of imitation. A few general statements on child psychology conclude this keen and instructive analysis of the subject in hand.

Abnormal psychology was represented by Messrs. Pierre Janet and Morton Prince. M. Janet's address[9] deals primarily with the phenomena of oscillating mental levels which present us, in his judgment, fundamental problems for both normal and abnormal psychology. His interesting paper is in large measure a running analysis of the symptomology of these states.

Normal oscillations of the character at issue are encountered in fatigue, in sleep, and in emotional states. In fatigue, for instance, we find exaggeration of movements, modifications of reflexes, and disturbances of the associative memory processes. In sleep, or 'sleeps,'

[9] 'Mental Pathology,' *Psychological Review*, 1905, pp. 98–117.

as he maintains we should more precisely say because of the divergent character of many of the phenomena included under this term, we find attention and will are lacking, the consciousness of personality is disturbed, and upon awakening amnesia is present in varying degrees. Emotion discloses various related disturbances and especially the extreme forms of depressor and excitor phenomena.

Correlated with these oscillations of normal life are such abnormal conditions as we meet with in hysteria and in the obsessions. Just as in fatigue and in sleep, so in hysteria the characteristic symptom is a narrowing of the conscious field. In this particular, the two groups of phenomena show themselves identical. In the obsessions we meet with certain mental disturbances correlated with motor and visceral irregularities. Taking all the available facts into account, it seems clear that the several functions of the nervous system are by no means equally difficult to execute. It is the most complex and most difficult which first go to pieces under the influence of undue strain or of disease. As M. Janet puts it, 'mental processes break down more quickly the higher their coefficient of reality.' From this point of view, imagination and abstract reasoning are not the highest mental operations. At least, not the most difficult. It is only when they have to do with *felt* reality, with *present* pressing problems, that they become difficult.

This conception gives an interesting functional classification of mental processes cross-sectioning the common classification of content. From this standpoint we must think of reasoning *per se,* not so much as a specific form of mental operation; we must rather inquire into the precise objective and subjective conditions under which a reasoning process is called forth, if we wish to give it its proper psychological setting. Supported by the weight of M. Janet's authority, we may look to see this conception adopted tentatively at least, and its application to other mental processes worked out in detail.

The address of Mr. Prince[10] contains an admirably clear and conservative presentation of certain fundamental aspects of contemporary work in abnormal psychology.

He proposes a division of abnormal phenomena into two great classes: first, those of dissociation or weakened synthesis, such as the anesthesias, amnesias, and paralyses, divisions of personality and changes of character. In the second group belong the automatisms (motor activities which defy the will), such, for instance, as the obsessions, the fixed ideas and impulsions. These divisions are not to be understood as reflecting mutually exclusive phenomena, but simply

[10] 'Some of the Present Problems of Abnormal Psychology,' *Psychological Review,* 1905, pp. 118–143.

as characterizing fundamental types of mental disturbances. The future of abnormal psychology can be considered as chiefly dedicated to unraveling the complexities of one or other of these great types of disease.

Mr. Prince rightly regards the problem of the subconscious as constituting one of the most compelling with which abnormal psychology is confronted and a large part of his paper is devoted to a discussion of the principal matters here at stake. Indeed, psychology of every kind is sorely in need of illumination on these points.

The author examines with great fairness and care the various lines of evidence (double personalities, hypnosis, automatism, absent-mindedness, etc.) upon which certain psychologists have been wont to assign to subliminal mental conditions a high degree of importance in the affairs of normal mental life, and he comes to the conclusion that the facts by no means warrant the interpretation which has been given them. The details of Mr. Prince's argument can not be cited, but the reader is cordially recommended to the original. The present writer was undoubtedly biased in the direction of Mr. Prince's view before reading his paper, but the array of considerations which the latter has brought together are certainly impressive and, so far as they go, convincing.

The inquiry as to the subconscious inevitably raises the question as to the nature of the dissociating mechanism by means of which the phenomena previously referred to are produced. It has not only proved possible to group together as instances of dissociation such mental diseases as aboulia, paralysis and the amnesias, but it is also possible to regard sleep, hypnosis, somnambulism, etc., as dissociative phenomena. It is a matter of distinct interest to remark that, although the proximate causes which lead to these phenomena of disaggregation may be and often are psychological in character, the dividing lines which seem actually to be followed are rather physiological. At all events, they suggest no psychological relations. Mr. Prince regards it as probable, therefore, that there exists some normal physiological dissociating mechanism which may operate more or less all the time in normal experience, but which becomes exaggerated and perverted in its action during disease.

Taken in their entirety, these papers give the psychologist a flattering sense of the massiveness and dignity of the science which he espouses. So much of solid achievement to stand upon, so wide a territory already laid under contribution,—surely these things augur a rapid advance and the speedy realization of those dreams of conquest which fifty years ago seemed the chimerical creatures of overweening ambition.

JAMES ROWLAND ANGELL.

THE UNIVERSITY OF CHICAGO.

MEASUREMENT OF TWINS[1]

THE following is a summary of the results of a study of the comparative importance of original nature and training in the case of fifty pairs of twins. A detailed account of the investigation will be published shortly.

The Resemblances of Twins and of Siblings

From the information at hand, which is not so satisfactory as information I hope to obtain during the next few years, the resemblance of twins in mental traits is roughly twice that of ordinary siblings;[2] according to the actual figures of my measurements of siblings, more than twice. I have reason, however, to believe that the correlation coefficients obtained for siblings are affected by constant errors which make them too low; namely, the selection of mentally unlike pairs by the conditions of the methods of obtaining siblings and the absence of suitable data to make sufficient correction for attenuation. Table 1 gives the facts.

I use the words *'resemblance of'* and *'likeness of'* as synonyms for *'coefficients of correlation between.'* A resemblance of .50 means, then, a Pearson correlation coefficient of .50. I use the terms A test, word test, misspelled word test, opposites test, addition and multiplication to mean the tests, or at times the abilities measured by the tests, to describe which would take too much space.

TABLE 1

The resemblances of twins and siblings compared

Ability	Coefficients of Correlation	
	Twins	Siblings
A test	.69	.32
Word test	.71	.29
Opposites test	.90	.30

I give for siblings the obtained results. Since the correction for attenuation had to be made in an imperfect form, the true resemblances are probably somewhat higher, but not over .40.

The Resemblances of Young and of Old Twins

The older twins show no closer resemblance than the younger twins, and the chances are surely four to one that with an infinite number of twins tested the 12–14 year olds would not show a resemblance .15 greater than the 9–11 year olds. The facts are given in Table 2.

[1] The investigation here reported was made possible by a grant from the Esther Herrman Research Fund of the New York Academy of Sciences.

[2] Karl Pearson has pointed out that the word *sibling* is a convenient term to denote children of the same parents.

TABLE 2

The resemblances of young and old twins compared

	In Corrected Coefficients		In Raw Coefficients	
	Twins 9-11	Twins 12-14	Twins 9-11	Twins 12-14
1) A test	.66	.73	.58	.67
2) Word test	.81	.62	.62	.49
3) Misspelled word test	.76	.74	.76	.74
4) Addition	.90	.54	.83	.46
5) Multiplication	.91	.69	.81	.53
6) Opposites	.96	.88	.79	.78
Marks in 1), 2) and 3) combined			.71	.69
Marks in 4), 5) and 6) combined			.90	.75
Averages	.83	.70	.75	.64

The Resemblances in Traits Little and in Traits Much Subject to Training

The variations in the closeness of resemblance of the twins in the different traits show little, and possibly no, direct correlation with the amount of opportunity for environmental influences. The traits most subject to training (addition and multiplication) do show closer resemblances than the traits least subject to training (the A test and word test); but on the other hand show less close resemblances than the traits moderately subject to training (the misspelled word test and opposites test). The hypothesis that the true resemblance varies in amount *inversely* with the amount of opportunity for environmental influence would not be irreconcilable with the facts, and the hypothesis that the differences between the different traits are due to chance (including in that term the variable errors of the measurements and the possibility of the unequal inheritance of different traits) is the most probable of all. The difference between the traits most subject and those least subject to training is no greater than the median difference between any one trait of the six and any other. Surely there is no evidence here of any large contribution from similarity of training to similarity of achievement. The facts are given in Table 3.

The Resemblances in Mental Traits Compared with the Resemblances in Physical Traits

It is highly probable from the facts so far given that the similarity of twins in ancestry and conditions of conception and birth accounts for almost all of their similarity in mental achievement,—that only a small fraction of it can be attributed to similarity in training. On general principles it is also highly probable that similarity of ancestry and conditions of conception will produce equal similarity in original physical nature and in original

TABLE 3

The resemblances of twins in traits little and in traits much subject to training

	Coefficients of Correlation	Averages
1) A test	.69	.70
2) Word test	.71	
3) Misspelled word test	.80 (?)[3]	.85 +
6) Opposites test	.90	
4) Addition	.75	.795
5) Multiplication	.84	
Marks in 1), 2) and 3) combined	.70 (raw)[4]	
Marks in 4), 5) and 6) combined	.82 (raw)[5]	

mental nature. Certain resemblances in original physical nature are in all probability neither increased nor decreased by such similarities and differences of home training as act upon twins and non-related children, respectively, within a group such as ours; *e. g.*, resemblances in cephalic index, ratio of height sitting to total height, eye color and hair color. Other resemblances in original physical nature are so increased and decreased slightly and perhaps not at all; *e. g.*, circumference of head, length of head, width of head, length of forearm and length of finger joints.

If, then, the resemblances of twins were almost entirely due to original nature, we should expect them to be only slightly in excess of the resemblances in physical traits. The existence of the latter as a fact may properly be taken as a partial verification of the former as a general hypothesis. The evidence of its existence is given in Table 4.

Summary and Criticism

These facts prove that among one hundred twins living and attending school in New York City in 1903–4, the mental resemblances of a twin pair are about twice as great as those of a pair of siblings similarly chosen, are as great or nearly as great in the case of the younger as of the older half of the group, are as great or nearly as great in the case of the A, word, misspelled word and opposites tests as in the case of addition and multiplication, and are only slightly, if at all, greater than resemblances in physical traits which could have been caused, in some cases, only by original nature.

The facts are easily, simply and completely explained by one simple hypothesis: namely, that the natures of the germ-cells—the conditions of conception—cause whatever similarities and dif-

[3] The raw coefficient was .754. I have no means of correcting for attenuation except indirectly. The corrected coefficient would be at least .80.

[4] The correction for attenuation would increase this only slightly, since it is derived from seven trials. The true r can hardly be above .75.

[5] The case is as noted in note 4. The true r can hardly be above .85.

ferences exist in the original natures of men, that these conditions influence body and mind equally, and that in life the differences in modification of body and mind produced by such differences as obtain between the environments of present-day New York City public school children are slight.

Certain other hypotheses seem possible at first sight, but become involved in great difficulties when one tries to explain all the facts

TABLE 4

The resemblances of twins in mental and in physical traits

In Mental Traits		In Physical Traits	
1. A test	.69	11. Cephalic index	.76
2. Word test	.71	12. Ht. sitting/ht.	.76
3. Misspelled—	.80 +	13. Height	.78
4. Addition	.75	14. Height sitting	.83
5. Multiplication	.84	15. Circ. of head	.75
6. Opposites	.90	16. Width of head	.86
7. Combined mark in 1–3	.70 +	17. Arm length	.72
8. Combined mark in 4–6	.82 +	18. Finger length	.71

7, 8 and 12–15 are raw correlations and the correction for attenuation might raise them by .01 or .02.

Median of 1–6	.78	Average of 11–12	.76 (possibly .77)
		" 13–18	.77 (possibly .78 or .79)
Average of 1–6	.78	Median of 13–18	.77 (possibly .78 or .79)
		" 11–18	.76 (possibly .77)
Average of 7–8	.76 (possibly .80)	Average of 11–18	.76 (possibly .77)

by any of them. These difficulties I will point out briefly.

It may be said that all that has been proved of the twins is that they are alike in general mental maturity (*i. e.*, in the points of development which they have reached).

Traits like those tested are of course influenced by maturity directly and indirectly through the relation between maturity and advance in school and the relation between the latter and certain of the traits tested. But maturity is by no means the total cause of efficiency in these traits. Nor is it a cause comparable in amount of influence with individual differences apart from maturity. Nor is there any evidence that there is any greater resemblance of twins in maturity than in other factors, such as eyesight. If maturity were the total cause of efficiency in the six traits measured, these traits should in the same individual show perfect correlation with each other. They do not, nor, indeed, enough correlation to assign maturity a very important place as a contributory cause. If resemblance in maturity were the cause of the resemblances found, these should be largest in the traits most subject to maturity. The opposite is the case.

It may be said that all that has been proved of the twins is that

the environmental conditions from 9 to 14 years count little; that the similarities in environment *in utero* and during childhood are left as possible causes of the resemblances found; and that these are the real causes. But that the conditions *in utero* are the cause of the resemblances of related individuals is disproved by the fact that paternal is as great as maternal resemblance in the case of those traits where parents and offspring have been compared; and that similarities in environment from 0 to 9 years should produce a far greater effect on the children's abilities to add, multiply, mark misspelled words and write opposites than do similarities in environment from 9 to 15 is a notion utterly devoid of probability.

It is equally difficult to accept original nature as a cause of a moderate amount of the resemblance found and to explain the rest as due to training. Suppose, for instance, that some one assumes that the force of the germ-natures,—of the conditions of conception,—is sufficient to produce a resemblance of .20 in siblings and .40 in twins in mental traits. He must then be willing to believe that the likeness in training of a twin pair is enough greater than the likeness in training of a sibling pair, two or three years apart in age, to make the .40 rise to .80, whereas the .20 rises only to .40 or less. He must also be willing to believe either that inborn mental make-up is inherited by a totally different law from that regulating inborn physical make-up or else that the similarities in training of twins will raise .40 to .80 in physical traits such as cephalic index, and that the similarities in training of siblings will raise the .20 only to .40 or .50. He must also place the bulk of influence of this training previous to the tenth year and assume that it is of such a generalized sort as would raise the resemblances in marking A's or words containing *r* and *e* as much as that in multiplication.

Doubtless we all feel a repugnance to assigning so little efficacy to environmental forces as the facts of this study seem to demand; but common opinion also feels a repugnance to believing that the mental resemblances of twins, however caused, are as great as the physical resemblances. Yet they are. I can not here discuss the general facts and detailed studies which bear upon the question of the amount of influence of such likenesses and differences in environment as existed in the case of these twins.

I shall also spend but little time in comments upon the application of the facts so far presented to theories of education and human action and to the practical problems of social control. The inferences with respect to the enormous importance of original nature in determining the behavior and achievements of any man in comparison with his fellows of the same period of civilization and conditions of life are obvious. All theories of human life must

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accept as a first principle the fact that human beings at birth differ enormously in mental capacities and that these differences are largely due to similar differences in their ancestry. All attempts to change human nature must accept as their most important condition the limits set by original nature to each individual.

We must be careful, however, not to confuse two totally different things: (1) the power of the environment,—for instance, of schools, laws, books and social ideals,—to produce differences in the relative achievements of men, and (2) the power of the environment to produce differences in absolute achievement. It has been shown that the relative differences in certain mental traits which were found in these one hundred children are due almost entirely to differences in ancestry, not in training; but this does not in the least deny that better methods of training might improve all their achievements fifty per cent. or that the absence of training, say in spelling and arithmetic, might decrease the corresponding achievements to zero. Similarly, the fact that Mr. Rockefeller has amassed one of the great fortunes of the age is undoubtedly due almost exclusively to his original capacity, not to circumstances; but this does not deny that it is almost exclusively circumstances which make the average wealth of men to-day greater than it was a thousand years ago or that future changes in the environment might, without any change in capacity, make nine men out of ten the owners of automobiles, race-horses, tall hats and the other blessings of wealth.

The argument has been limited entirely to the causes which make one person differ from another in mental achievements *under the same general conditions of life at the beginning of the twentieth century in New York City as pupils in its school system.* If the resemblance of twins had been measured in the case of a group made up partly of New York City school children and partly of children of equal capacity brought up in the wilds of Africa, the variability of the group in addition and multiplication would have increased and the correlation coefficients would rise. They would then measure the influence of original nature plus the now much-increased influence of the environment.

The relative impotence of such similarities of home training as existed in our fifty pairs of twins to create similarities of achievement does, however, make one suspect that the magnitude of the influence of the training given by schools, periods of civilization and the like has been exaggerated. For other reasons, also, I imagine this to be the case, but to prove or disprove it, one would need data quite different from the records of these hundred twins.

It is, then, folly to conclude that the inheritance of mental capacities from immediate ancestry implies the futility of education and

social control in general,—the wisdom of fatalism and *laissez faire*. Such studies as this merely prove the existence of and measure one determinant of human intellect and character and demonstrate that the influences of the environment are differential, the product varying not only in accord with the environmental force itself, but also in accord with the original nature upon which it operates. We may even expect that education will be doubly effective, once society recognizes the advantages given to some and denied to others by heredity. That men have different amounts of capacity does not imply any the less advantage from or need of wise investment. If it be true, for example, that the negro is by nature unintellectual and joyous, this does not imply that he may not be made more intelligent by wiser training or misanthropic and ugly-tempered by the treatment he now receives. It does mean that we should be stupid to expect the same results from him that we should from an especially intellectual race like the Jews, and that he will stand with equanimity a degree of disdain which a Celt would requite with dynamite and arson.

To the real work of man for man,—the increase of achievement through the improvement of the environment,—the influence of heredity offers no barrier. But to the popular demands from education and social reforms it does. For the common man does not much appreciate absolute happiness or absolute betterment. He does not rejoice that he and his children are healthier, happier and more supplied with noble pleasures than were his ancestors of a thousand years ago. His complaint is that he is not so well off as some of those about him; his pride is that he is above the common herd. The common man demands *relative* superiority,—to be above those of his own time and locality. If his son leads the community, he does not mind his real stupidity; to be the handsomest girl in the county is beauty enough. Social discontent comes from the knowledge or fancy that one is below others in welfare. The effort of children in school, of men in labor and of women in the home is, except as guided by the wise instincts of nature or more rarely by the wisdom of abstract thought, to rise above some one who seems higher. Thus the prizes which most men really seek are, after all, in large measure given or withheld by original nature. In the actual race of life, which is not to get ahead, but to get ahead of somebody, the chief determining factor is heredity.

EDWARD L. THORNDIKE.

TEACHERS COLLEGE, COLUMBIA UNIVERSITY.

REVIEWS AND ABSTRACTS OF LITERATURE

Optical Illusions of Reversible Perspective. A Volume of Historical and Experimental Researches. J. E. WALLACE WALLIN. Princeton, N. J., 1905. Pp. 330. Published by the author.

This book deserves notice for two excellent reasons. First, it represents the most extensive foraging and collecting that has yet been done in this field. Secondly, the various chapters set forth in wisely conservative forms of statement what may probably be taken to be the best present opinion on the topics treated.

The historical part has been so thoroughly done, I should say, that a similar canvassing of the literature need never be undertaken again. This section occupies about a third of the volume. The digests, massed in five chapters under convenient descriptive headings, form a sort of reference encyclopedia with the essential cuts and diagrams reproduced. Pseudoscopy, together with the instruments involved, is given adequate treatment. The use of these pages is facilitated by rather full references to them in the general index.

The experimental portion offers no particularly revolutionary facts. The chief novelty here is one of method. Attention being given predominantly to the examination of equivocal geometrical diagrams, certain selected figures are viewed under the condition of momentary exposure, .03 sec. being approximately the time employed. In general the author has made use of the stock equivocal figures, but to these he has added a few excellent ones of his own devising. The very large number of experiments made leads to results that, when discussed in connection with existing opinion and conjecture, form a quite respectable body of doctrine. Some of the leading conclusions of the book may now be summarized. As hinted above, these conclusions are often characterized less by their novelty than by the fact that their truth seems now doubly assured.

1. Plane geometrical drawings are overwhelmingly envisaged perspectively. In 4,887 exposures only two per cent. of the figures were seen flat.

2. Each figure of this variety has a 'predominant' or 'preferred' perspective. Thus the Neckar parallelopiped is seen with its top forward about four times as frequently as with its base in the foreground. Certain figures, like the pyramid and the Mach book, seem, however, to have no marked predominant.

With these facts secure, the real problems of the matter arise. What we particularly wish to know is (*a*) what the predetermining conditions are under which we spontaneously or voluntarily see any one of several possible perspective forms, and (*b*) what happens when the perceived form of perspective changes, this change being, like the original perception, either spontaneous or intentional. In other words, we wish to know what the eyes are doing and what central factors are operative in the various stages of this perception of reversibles. Indeed, an entire treatise on this subject of equivocal perception might well be outlined on the basis of these two questions. The replies found acceptable to the author are chiefly as follows:

(*a*) *Central factors.*—(1) Preperception plays the leading part. This may refer either to the fact that the figure is perceived in the form of the object that has been prevailingly or habitually experienced, or to the fact that the form perceived is esthetically preferable. In any case this explanation must be supplemented by the hypothesis of a 'secondary disposition' to account for the occasional seeing of the non-predominant form. The author seems not disposed to deny that this central factor may be the essential precondition of an appropriate and more powerful peripheral factor.

(2) Suggestion is efficacious. Experiments were made upon schoolboys from nine to sixteen years of age under the same general conditions as those used elsewhere. Whereas the ratio of the preferred to the non-predominant perspective was, for all figures used, in the case of adults 63 per cent. to 22 per cent., the percentage of non-predominants seen was here raised by suggestion to 68. The percentage of predominants seen under the influence of suggestion was 77.

(3) The will and the imagination, against which as primary factors Wundt has made such vigorous protest, are admitted by the author to play positive rôles only when other determining factors hang in the balance. Whatever the ultimate opinion about these factors, 'it seems conservative to conclude that the perspectives can never be absolutely controlled or unconditionally reversed by mere activity of will, imagination or judgment.'

(4) Practice may to a limited degree make a non-predominant more readily and frequently seen. Its effects are, however, transitory. The central nature of the effects of practice is evidenced by the fact that the unpracticed eye gives the same results as the other.

(*b*) *Peripheral and external factors.*—(1) Fixation. One of the fundamental theses of the book is, as the author asserts, 'that there is an *adversion motive toward the point of regard.*' However, considerable caution is displayed, as may be seen from the following statement of the matter. "On the whole, there seems to be no direct evidence against, while there is some in support of, the conclusion that 'the virtue' or efficacy of fixation consists in adversing or attracting the point or parts fixated toward the retina of the observer." This attracting of the fixated parts (again speaking cautiously) is probably to be ascribed to strain sensations and to the greater clearness secured.

It is noted that a special fixation may become markedly operative only after weeks of practice, which may, of course, be evidence merely of a very refractory predominant.

In connection with some experiments on the time required to produce a reversion voluntarily, it was found that a part directly fixated reversed two and a half times faster than when viewed in indirect vision.

Reversions that occur during a supposedly rigid fixation are due, presumably, to relaxations through fatigue of the recti muscles.

(2) To accommodation as such the author declines to ascribe any determining rôle. This opinion he bases in part upon Loeb's demonstration, confirmed by his own observations, that reversions may occur with

atropinized eyes, and in part upon the unfavorable or equivocal results of experiments to test the effect of altering the accommodation by means of lenses. Special experiments upon the general function of the accommodation in the perception of the third dimension lead to the same adverse conclusion.

(3) Binocular vision increases the number of predominants seen in certain cases and diminishes them in others. Monocular vision yields, on the whole, greater uniformity.

(4) Increasing the distance of the figure from the eye favors the seeing of the concave form of a perspective.

(5) As to illumination, the distribution of light and shade by the throwing of cast-shadows is of course highly effective. A further fact of much importance and one carefully investigated is that white lines on black tend strongly to advance into the foreground. In an attempt to equate the distances of black and white rods the average difference between them was one thirty-eighth of the standard. The superior brightness and clearness of the white is probably the determining factor.

The final chapter of the book is devoted to a recapitulation and to a comprehensive survey and discussion of theories. As the reader might readily predict, it is the psychophysical, as against the psychological, theory that is recommended as adequate to meet the case of these illusions of reversible perspective. No precise formulation of the theory is proposed, somewhat loose generalities comporting better with the present state of our knowledge.

It is a pity that a volume with the merits of this one should have certain conspicuous defects serious enough to keep it from being more generally read. To be sure, the cuts with which both the historical and the experimental sections are plentifully supplied are most excellent. But the typography is wretched, as the author himself admits and laments. And, what really furnishes the forbidding aspect of the book, occasional sections and chapters are written with inexcusable obscurity both of language and of presentation. One finds everywhere a perverse tendency toward endlessness of subdivision and toward a plethora of adjectival characterization. This, coupled with an exasperating cloudiness of style into which the author is led by the exigencies of a compensating condensation, makes the reading of the volume anything but easy. Frequent recapitulations partially redeem these defects, and the attention is occasionally caught by suggestive criticisms, side-comments and discussions.

An unusually full index closes the volume.

A. H. PIERCE.

SMITH COLLEGE.

Psychologie und Pathologie der Vorstellung. Beiträge zur Grundlegung der Aesthetik. RICHARD WALLASCHEK. Leipzig: Barth. 1905. Pp. x + 323.

This work purports to be a partial prolegomenon to esthetic theory; a finished prolegomenon would, the preface says, have to include further an investigation of sensation, feeling and judgment similar to the one

here made of *Vorstellung*. After reading the work, however, the reviewer can not avoid the conclusion that it is really an attempt to prove certain theories by recourse to clinical evidence. What is given is in no wise a contribution to any branch of psychology, but rather a highly interesting rearrangement of long-known material suited to lend a certain probability to one or two 'principles' of esthetics, especially to the hypothesis of the complete independence of feeling, thinking and reacting, and *a fortiori* to the theory of the fundamental identity of artistic enjoyment, secondary sensations and hypnotic states.

The non-rational character of esthetic states is held to be proved by the absolutely variable and indeterminable nature of the *Vorstellungen* induced by feelings (p. 144). There is, accordingly, no causal connection between *what* we have 'in fantasy' while we are feeling in a particular way and the character of this feeling itself. But this fact—if it be one—is nowhere clearly distinguished from the very different one that certain things induce certain sorts of feeling. The writer is constantly confusing the two, although his last word is that 'in the long run not everything can be held to be beautiful' (p. 308), thus indicating the possibility and necessity of objective esthetic science.

Another hopeless difficulty for the reader lies in the constant shifting of standpoints. At one time we are told what associations some people have with certain feelings. Then again, how one must proceed in order to produce esthetic enjoyment in others, once again—and this very commonly—the pedagogical significance of facts brought to light by pathological and normal cases of association, chromesthesia, hypnotism, etc. In one instance the insertion of a pedagogical digression is intolerable; the writer fills twenty pages with a theory of teaching piano-playing! (pp. 92 ff.). One can never tell just what the book is trying to show.

Unfortunately, the most interesting things noted have nothing to do with establishing a theory of esthetics. For instance, the origin and function of secondary sensations (pp. 187–192) and the significance of dream-types (pp. 258 ff.) are highly readable topics. The author attempts to explain all instinctive activity as an effect of secondary sensations. Speaking of cattle which avoid poisonous weeds, he says: 'If looking at or smelling of a weed induces at once secondary taste-sensations of the same kind and effect as induced by the actual eating of the weed, then we can understand the cow's abstinence' (p. 191). Quite true, the reader will say; but this view does not eliminate the problem of the origin of this strange interactivity, as Wallaschek supposes it does when he says that the whole theory of heredity can now be dispensed with! One might ask, indeed, what sort of secondary sensations account for the migratory instincts of birds, etc. The writer devotes a page and a quarter (with one illustration) to put all evolutionary biology out-of-doors! With regard to dreams, we are told that secondary sensations here gain the control of our experience (p. 258), and that absolutely all judgment is, therefore, lacking in sleep-experiences (p. 259). This latter statement can not be taken scientifically, but only in the popular sense of the word 'judgment.' The supposedly prophetic character of dreams is explained

as the working of secondary sensations which in sleep induce associations that otherwise would be swamped by voluntarily controlled attention; hence the various sorts of dreams we have are indices of certain typical experiences (p. 260). Whether Wallaschek's interpretations of special types of dream adventures are correct, the physiologist must help us to determine; at all events, they are ingenious.

The writer connects esthetic pleasure with dream-experiences, both being, as he thinks, cases of non-rational domination of secondary sensations. So, he says, it is a fundamental principle that music ought to be enjoyed just as a dream is (p. 268). The subjective freedom is what constitutes the indescribable pleasure of both dreaming and listening to music. Perhaps nowhere else does the purely individual, non-scientific character of the whole book stick out so clearly as here; in calling esthetic enjoyment 'subjectively free' in the way dreams are, the writer brings in the most harmful equivocations, inasmuch as *what* we are free from in each case is utterly different. Dreaming is abject slavery to physiological conditions (roughly speaking), whereas 'roaming in fantasy' while hearing music is a procedure most emphatically under the control of the will to no inconsiderable extent. Other equally great differences may readily be noted, too. Wallaschek, however, repeats in another connection his conviction that the effect of esthetically experienced things upon us is essentially hypnotic (p. 306). This is, of course, the consistent outcome of his absolute divorcement of emotion and thinking. The implication of all this is plainly that, whatever may induce a particular feeling, there is involved at no point an essential reference to an object; feelings can be, must be, associated independently of all association of things connected somehow with these feelings. To the psychologist and logician, it is clear that Wallaschek is once more speaking of 'objects' in the popular sense, just as he does of 'judgment.' The critic must protest, though, that even infinite (absolutely non-repeating) variation in 'associations' would never even make it probable that *no* reference to objects is implicated in esthetic feeling. Another consistent statement is that artistic genius is essentially frenzy, an absolutely pathological rendition of inner experiences (p. 297); outward self-control does not change the deepest nature of the genius's experiences at all. The difference between genius and madman lies in the possession by the former of 'normal consciousness' and in its absence in the latter. Incidentally, it might be noted that the arguments based upon statistics about the geographical distribution of the insane (p. 257) are wholly illogical. Again, incidentally, the epistemological conclusions about the character of space and time as drawn from observations of narcosis are almost humorous (p. 248).

In spite of the unfavorable impression of the work which the above notes will convey, there is, nevertheless, much to be said on the other side. The author is plainly an esthete in blood and bone, individualistic to the point of enthusiasm; yet the facts brought together here signify a vast command of literature and an exceptionally high order of expository ability. The readability of the book is unhappily out of all proportion to its scientific value. As a reference-work for beginners in psychology

it might well find approval by reason of its admirable bibliography of pathological cases and the vast number of detailed reports on such. But there is not a single statement made, not a single conjecture advanced, which gives hope of solving any of the problems which the majority of students regard as the really fundamental ones in esthetics. The work itself is an esthetic production, not a scientific one; a strange mass of perfectly true facts clustered in a way more or less irrelevant to psychological interests.

WALTER B. PITKIN.

BERLIN, GERMANY.

JOURNALS AND NEW BOOKS

ZEITSCHRIFT FÜR PHILOSOPHIE UND PHILOSOPHISCHE KRITIK. Band 126, Heft 2, July, 1905. *Der Wandel in Schillers Weltanschauung* (pp. 113–139): H. CLASSEN. – Insufficient attention has been given to the wide divergence of Schiller's earlier, Platonic, mystic, theosophic beliefs from the introspective and humanistic doctrines that held him later. To the end his philosophy was unsettled. *Die neuren Bände der akademischen Kant-Ausgabe* (pp. 140–167): K. VORLÄNDER. – Notes on the revelations of Kant's personality in his latest letters. Sundry comments on the order and on other special features of the first four volumes of the edition. *Identität und Gleichheit mit Beiträgen zur Lehre von den Mannigfaltigkeiten* (pp. 168–188): K. GEISSLER. – From a study of the use of the terms, identity and equality in mathematics, the conclusion is drawn that it is at least doubtful whether we can for logical purposes use the terms as significant elements apart from specific contexts, their meanings varying so that we can not use the terms absolutely. *Ueber den Text der Lucasschen Biographie Spinozas* (pp. 189–208): J. FREUDENTHAL. – The editor replies to v. Dunin-Borkowski's criticisms. *Recenzionen* (pp. 209–226): Guido Villa, *Einleitung in die Psychologie der Gegenwart:* STÖRRING. D. Hume, *Eine Untersuchung über die menschliche Vernunft. Deutsch von C. Nathanson:* H. BROMSE. J. Freudenthal, *Spinoza, Sein Leben und seine Lehre:* LÜLMANN. J. Baumann, *Deutsche und ausserdeutsche Philosophie der letzten Jahrzehnte dargestellt und beurteilt:* K. VORLÄNDER. L. Goldstein, *Moses Mendelssohn und die deutsche Ästhetik:* A. TUMARKIN. *Entgegnung. Selbstanzeige, Notizen. Neu eingegangene Schriften.* Aus Zeitschriften.

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Mach, Ernst. *Erkentnis und Irrtum.* Leipzig: Barth. 1905. ix + 461 pp. 10 M.

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Walter, J. et al. *Zur Erinnerung an Immanuel Kant.* Halle: des Waisenhauses. 1904. 374 pp.

Wiechowski, K. *Die Unterbrechung des Kausalzusammenhanges.* Breslau: Schletter. 8vo. 1.70 m.

Windelband, W. *Die Philosophie im Beginn des 20 Jahrh. s. I. Bd.* Heidelberg: Winter. 1904. 8vo. 5 m.

Wundt, W. *Völkerpsychologie: Eine Untersuchung der Entwicklungsgesetze von Sprache, Mythus und Sitte. I. Bd.: Die Sprache. Heft 2., umgearb. Aufl.* Leipzig: Engelmann. 1904. 673 pp. 14 m.

NOTES AND NEWS

MACH'S famous book on mechanics has reached its fifth edition. Especial attention is paid to recent statements of the law of inertia, and, in view of the French translation of his book, the author has taken account of modern tendencies in France. It is of interest that many French writers, independently, or influenced by Mach only indirectly, have come to occupy very similar positions, as for example Poincaré and Duhem.

THERE has appeared a third edition of Dr. Richard Dedekind's pamphlet on 'Stetigkeit und irrationale Zahlen.' The essay had its origin about 1858, when the author undertook to lecture on the calculus. Finding no satisfactory treatment of the concept of continuity in existence, he was forced to produce one of his own. Dedekind discovered his own definition on November 24, 1858, and the present pamphlet was written in 1872 in commemoration of his father's jubilee.

F. H. THIELE (*Journal of Physiology*, July 13, 1905) has discovered in the posterior region of the optic thalmus centers which he believes control the coordinated movements of walking. G. Pagano (*Arch. Ital. de Biol.*, May 10, 1905), experimenting on dogs, has been able to map out distinct areas in the cerebellum and show their relation to movements of definite parts of the body. The motor centers of the cerebellum are more deeply situated than those of the cerebrum.

THE present interest in the empirical standpoint appears in the title, 'Bibliotheque de Philosophie Expérimentale,' a series of volumes promised by the *Revue de Philosophie*. Among the titles announced may be mentioned: 'Les fondements metaphysiques des sciences,' by J. Bulliot, 'Les geometries non euclidiennes' by L. Delaporte, and 'La theorie physique, son objet et sa structure' by P. Duhem.

PROFESSOR EUGENE W. LYMAN, of the Congregational College of Canada, Montreal, has been appointed professor of philosophy and theology in the Bangor Theological Seminary, Bangor, Maine.

PROFESSOR E. RAY LANKESTER, director of the British Museum of Natural History, was elected president of the British Association for 1906, at the final meeting of the association held at Johannesburg, on September 1.

PROFESSOR ALEX B. COFFEY, of the University of Wisconsin, has been chosen to succeed Dr. Payne in the department of philosophy and education at the College of William and Mary.

DR. J. W. HICKSON has been appointed assistant professor of psychology and lecturer in philosophy at McGill University.